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SOCIAL ASPECTS OF TUBERCULOSIS

Tuberculosis is distinctly a social problem. The microscope has brought about the recognition of this fact. As long as science looked upon consumption as hereditary and held out small hope of recovery to the stricken one and small chance of escape to his children, it was merely a family affair, calling for whatever of fortitude could be summoned to endure the inevitable suffering of one's self and relatives, but making at the most only one demand, rarely heeded, in the interest of society,—that children should not be brought into the world under this fatal shadow. But the discoveries of the last twenty years have laid heavy responsibilities on society, for they have made it plain that the prevalence of consumption is due almost wholly to social conditions, and have given ground for believing that man has it in his power to make consumption an evil as remote as leprosy.

Small-pox, diphtheria, typhoid fever, and yellow fever have all been worsted in their conflict with science, but consumption, though hard pressed by its rival, pneumonia, still holds its place in the United States as "Captain of the Men of Death." One-tenth of all deaths are due to this cause; in the large cities the proportion varies from 7 per cent to 15 per cent. The part played by social conditions in the propagation of this disease is two-fold. First, the presence of the specific cause depends on the extent to which the public mind is informed as to the etiology of consumption and the public conscience awakened as to the duties of the individual. The *bacillus tuberculosis* does not multiply after it has left the human body and it may be killed by the simplest disinfection, exposure to direct sunshine being the surest method; or it may retain its virulence for two years if allowed to remain in a dark, damp corner. In the second place, the individual organism exposed to the danger of infection resists or succumbs to the invasion of the *bacillus tuberculosis* according as it has been predisposed by inheritance and environment.

The incidence of consumption in point of age and sex reveals its importance as a social phenomenon. It does not fall with equal severity on men and women. Not only is the death-rate from consumption higher among males than among females, but the propor-

tion of all deaths caused by consumption is greater. Among males in New York City 13 per cent of the deaths are due to consumption, among females less than 10 per cent. This is the more noteworthy for the reason that thirty years ago the rates for the two sexes were practically the same. The difference in the rate of improvement must be due to two facts: that women are affected more directly than men by any advance in general economic prosperity, and that more improvement has been made in the housing conditions of the mass of the people than in their industrial conditions.

An analysis of the mortality from pulmonary consumption by age periods shows that it is an insignificant factor in the loss of life under fifteen years of age. It should be noted here that other tubercular diseases, for example, of the joints and glands, are of chief importance in infancy and childhood. Such diseases are not a considerable source of infection, but they indicate the way in which consumption, the source of all forms of tuberculosis, affects the well-being of children. Among both men and women consumption works its greatest havoc between the ages of fifteen and forty-five, when it causes about one-third of all the deaths that occur. After forty-five its importance diminishes. In this age-incidence of the disease lies its chief economic significance. It attacks preferably either young men and women who are just beginning to repay to society the capital that has been invested in them through the years of their helplessness and education or those who, a little further on in life, are at the height of their productive capacity and have families dependent on them.

Tuberculosis, depending as it does chiefly on the amount of sun and air, sanitary conditions and the standard of living, is favored by the aggregation of population in cities. In the rural part of the "registration states"¹ of the United States, the mortality from consumption in 1900 was 134 per 100,000 living, while in the cities of 8,000 inhabitants or over in the same states it was 205. The towns of 25,000 inhabitants or more in the State of New York have a death-rate from this disease not far from twice as great as the rest of the state. Lagneau has shown that in France the mortality from tuberculosis varies directly according to the size of the city, from

¹ The "registration states" in the Twelfth Federal Census included the six New England States, with New York, New Jersey, Michigan, and the District of Columbia. The "registration area" included, in addition to these states, most of the important cities all over the country. For this area the vital statistics are far more trustworthy than for the rest of the country.

490 deaths per 100,000 living in Paris, to 181 in the 95 cities of less than 5,000 inhabitants. This relation does not hold in the United States because of the action of many conflicting factors. That there is a direct relation between the prevalence of consumption and density of population cannot be disputed. London statistics show that the consumption death-rate varies according to the number of persons to a room, and in Dundee it has been found that it varies inversely as the number of rooms to an apartment. Dr. Körösi, of Budapest, found that consumption caused over 22 per cent of all deaths among the poor, but only 16 per cent among the well-to-do.

While no such figures are available for an American city, it is well understood that consumption is pre-eminently a disease of the tenements. This does not follow from mere density of population, but from the attendant evils of poverty, ignorance and carelessness, all of which operate to produce a physical condition predisposed to the disease, as well as to preserve rather than destroy the specific cause. In New York City the records of living cases known to the Health Department,² together with the records of deaths, show that consumption is not only more prevalent in certain parts of the city than in others, but that in any given district it is concentrated in certain streets, blocks and even houses. There are houses in which cases of consumption have occurred in each of the last nine years. There are others in the same block from which none have been reported. One house in Chinatown has a record of 37 cases in the nine years; another of 25; still another of 19. A house in the Syrian quarter shows 13 cases. There are sixteen houses in a single block in the Fourth Ward, a district formerly frequented by Irish, now being displaced by Italians, from which 123 cases have been reported since 1894. While the recurrence of cases of tuberculosis in the same house is presumptive evidence of house infection, still the burden of proof rests on scientific experiments. Experiments proving the virulence of dust taken from apartments that had been occupied by consumptives have been made by many scientists in many countries. Famous examples of infected institutions are afforded by the health statistics of the Catholic Nursing Orders in Prussia and of insane asylums and prisons in the United States and Europe,

²A system of voluntary notification of living cases was instituted here in 1894. Since 1897 all institutions and physicians have been "required" to report such cases. The reports from institutions are practically complete, and the compliance of physicians, though still far from universal, is steadily increasing.

and many physicians have recorded their experience of individuals or families attacked by phthisis, when the disease could be attributed to no other cause than the occupancy of rooms which had been infected by a consumptive. The mobility of the population in the tenements multiplies the danger from house infection.

All investigations into the relation of occupation to tuberculosis go to show that certain industries suffer from this disease more seriously than others. After making allowance for the process of natural selection by which the death-rate is kept low in industries demanding a high degree of strength, while it is correspondingly raised in those not prohibitory to persons of frail physique, and for the varying proportion of persons at the ages when consumption is most prevalent, it is found that the characteristics which tend to raise the death-rate from consumption in any employment are the following:

1. A low rate of wages, entailing discomfort and privations in the home.
2. Unsanitary conditions of the place of employment.
3. Exposure to dust arising from marble, stone, plaster, wood, metals or textiles.
4. Excessive physical exertion or a continued constrained position.
5. Close confinement within doors.
6. Exposure to excessive heat.
7. Temptations to intemperance.
8. Long or irregular hours.

There is space to refer in this connection to only one specific employment. Sweatshop industry is an active agent in transmitting consumption. Uniting as it does almost all the characteristics just enumerated, it is supremely favorable to the progress of the disease in the workers themselves. It is work, moreover, to which a consumptive can cling until his disease has reached an advanced stage, and even the work done by a well person may be carried to the bedside of a consumptive relative or friend, while the unfinished garments are used to supplement his coverings. The garments thus infected become a source of danger to all who handle them afterwards and to their ultimate possessors.

Of almost equal importance with housing conditions and occupation in determining the prevalence of consumption are habits

outside of working hours. Alcoholism is considered an important factor,—by Professor Brouardel, the “most potent factor”—in predisposing to tuberculosis. Since this view has obtained credence, the story of the sport-loving Englishman whose recovery was formerly attributed to the regular imbibing of seven tumblers of punch every night, is quoted as evidence of the value of duck-shooting and angling in the treatment of this disease. The susceptibility of cab-drivers to consumption is now explained, not by their exposure to the weather, but by the intemperance which characterizes them as a class. For frequenters of saloons the weakening effect of alcohol on the system is supplemented by exposure to a germ-laden atmosphere. No less vitiated than in saloons is the air in many of the dance-halls and theatres where the tenement dwellers seek their recreation. Outdoor amusements would go far toward counteracting unsanitary conditions of home and work-room.

It has been estimated that the excessive use of alcohol triples the susceptibility to consumption. The effect of other forms of dissipation cannot be stated with such mathematical precision, but it is none the less true that any habit that tends to lessen the vitality and impair the physical condition increases the mortality from consumption.

The variations in susceptibility seen in the population of the United States, when classified according to race and nationality, open an alluring field of speculation. The racial factor is so obscured by the census classification, by the age and sex constitution of the groups, by their distribution throughout the country and between city and country, by their economic condition, their occupations, and even their amusements, that it is difficult to distinguish its proper influence.

Comparing the population of the registration area of the United States on the basis of the obvious distinction of color, the consumption death-rate is found to be higher for all elements of the colored population than for the white. The rate for the white is 174 deaths from consumption per 100,000 living. The difference between the Japanese (204 per 100,000) and the white population is not too great to be attributed to the difference in age constitution of the classes, over 91 per cent of the Japanese being between the ages of fifteen and forty. The Chinese (657 per 100,000) also have an insignificant proportion of children and are found, moreover, almost entirely in

cities and in the worst parts of the cities. Their constitutions, weakened by tireless industry and parsimony as well as certain forms of bodily indulgence, offer slight resistance to the invasion of the consumption germ. The death-rate for the Indians (507 per 100,000) illustrates the disastrous effect of civilization on a savage race. Consumption follows on the transition from life in the open to urban conditions and its ravages are increased by the thirst for "fire-water."

The case of the negroes is more complex. To some extent they also are suffering from a civilization foreign to their nature, imposed upon them and not evolved by themselves. Everywhere the mass of the people is ignorant of the simplest laws of hygiene. They are prone to have an aversion for water, a preference for an unwholesome diet, and to choose their clothing, when they have a chance to choose it, for its decorative rather than for its utilitarian value. Generations of dependence have left them with a childlike faith in the interest and activity of higher powers in their behalf, which from the economic standpoint is mere unromantic improvidence. Until the Civil War they were an agricultural people; for the last forty years the city has been drawing them away from the fields. In all cities they live, for the most part, in the worst districts, crowded together in tenements often unfit for habitation. Whatever work they succeed in getting and keeping is indoors. Their whole life is thus spent in confinement, in unfavorable contrast with their ante-urban experience, when practically all the daylight hours were spent in the open air, and when their cabins, however crowded at night, and dirty and dark, were rarely sufficiently well built to provide against ventilation. In the cities, therefore, the ignorance and carelessness of the race in regard to laws of health find no let or hindrance to the working-out of their logical consequences. In the larger cities of the North, moreover, the severity of the winter, sufficiently trying to the semi-tropical constitution under favorable circumstances, becomes serious in its consequences when sufficient clothing is not only unobtainable, but its importance not understood.

Industrial conditions and irresponsibility on the part of husbands and fathers too often make the mother the chief or sole wage-earner, and the children are thus left to grow up as they can. The too small proportion who succeed in living through childhood and youth arrive at maturity with a weakened constitution and habits of life which offer every encouragement to the *bacillus tuberculosis*.

In the registration area, where 93 per cent of the negroes are found in cities, it is not surprising that even among the children consumption is prevalent. The death-rate from consumption under fifteen years of age, which is only 31.8 per 100,000 for the white population, is 246 for the colored, a rate considerably higher than is found at any age among the native-born whites of native parentage.

In comparing the various elements of the white population the census statistics allow of taking into consideration the factor of age.³ Among the white population between fifteen and forty-five

MOTHERS BORN IN	Under 15 Years.	15-44 Years.	45-64 Years.	65 and Over.
Ireland	42.2	428.0	340.9	324.7
Bohemia	13.2	235.2	124.9	101.0
Scandinavia	32.4	233.7	267.3	236.6
France	47.1	220.6	195.5	162.5
Germany	26.6	205.9	207.5	235.3
Scotland	32.0	201.1	201.8	238.5
Canada	34.5	190.7	163.8	237.3
United States	27.5	162.5	131.8	176.4
England and Wales	27.2	151.4	173.1	234.0
Italy	50.7	149.9	157.0	141.7
Russia	26.7	131.1	172.8	249.4
Hungary	38.6	113.4	125.1	187.3
Poland	11.4	67.4	103.9	243.2
Other countries	45.9	189.1	263.6	233.7

years of age the Irish easily lead the way with a rate nearly twice as high as that of the Bohemians next below. The predilection of the Irish for the crowded parts of cities, the Celtic tendency to take no thought for the morrow, and above all their frequent addiction to alcoholic drink, are circumstances that go far to explain their leadership. Habits in regard to drink explain other variations in this table. Thus the Scandinavians, who in the United States are almost as intemperate as the Irish, show a high death-rate from consumption, in spite of the fact that many of them live in the country and are engaged in agricultural work. The Italians, Russians, Hungarians and Poles are found at the other end of the scale, although they live almost exclusively in the tenement districts of the large cities, under far worse conditions than the Germans or even the Irish, and have a large preponderance of young men, the class most liable to consumption. But these nationalities are comparatively free from drunkenness.

³ Death rates from consumption, by age and birthplace of mothers, per 100,000 of the white population of the United States, 1900. U. S. Census, 1900: Vital Statistics I, clxxviii.

The case of the Italians is especially remarkable because they come from country villages to the crowded sections of our cities and under the new climatic and industrial conditions cling to their old farinaceous diet. On the other side it may be said that they have a temperament to which worry and anxiety are foreign and that the men are engaged in outdoor occupations. Almost half of the Italian men work here as common laborers on the construction of highways and railroads, while an aversion to the strenuous life leads many of the rest into the gentle and salubrious calling of peddling. But after bringing all these considerations to bear on the statistics, there remains to be reckoned with the testimony of practical workers that tuberculosis is more common among the Italians than is indicated by the death-rates. The fact that tuberculosis of the glands and joints is unusually prevalent among Italian children would also make one expect a higher consumption death-rate among the older generation. The explanation of this discrepancy is found in the attachment of the Italians for their native land, which frequently operates to find a way of sending the invalid home to die among the vines and olive trees of his native village.

The Russians, Hungarians and Poles, who show a still lower death-rate from consumption than the Italians, are nearly all Jews, and throughout the world Jews are found to have a comparatively low death-rate from this disease. Though there are indications that the Americanization of the Hebrew immigrants is being accompanied by an increased susceptibility to this disease, yet it is true that they are still comparatively immune. The most striking point in the study of the death-rate from consumption in New York City is that three wards of the lower East Side show the lowest mortality from this disease, although their density of population is almost the highest. The only explanation is that the population of these wards is largely Hebrew. The presence of an Irish minority serves only to raise the mortality higher than it would be if the Hebrews were alone.

It is probable that the death-rate among the Jews is not an accurate index to the prevalence of the disease, for the reason that among them the average duration of tuberculosis is much longer than among other races. "Quick consumption" is not common, and the disease often runs for eight or ten years before it proves fatal. The death-rate may be lowered also, though to a less extent than

among the Italians, by the return of some of their sick to Europe. Allowing for this, and assuming that consumption is considerably more prevalent than the death-rate indicates, it still appears that the Hebrew constitution has a remarkable resisting power. This power of resistance exists in spite of narrow chests and slight stature, in spite of extreme poverty and still greater frugality, in spite of mental overexertion, lack of exercise, employment in the sweated industries, and contact with the probability of infection in second-hand clothing. Various explanations have been advanced. Employment in occupations where they are protected from the weather can hardly be looked upon as an advantage. The infrequency of alcoholism, however, and indeed, their temperance in all directions, the mandates of their religion in regard to a careful inspection of meat before it can be pronounced "Kosher," and in regard to bathing and housecleaning at certain intervals,—all this helps to account for the fact that there is one evil which has not been meted out to this ill-used people to its fullest extent.

But tuberculosis is a social disease not merely in its origin, but also in the consequences which ensue.

Its relation to degeneration is a question that has been too little investigated. There are statistics indicating that consumptives and the children of consumptives are more liable than others to insanity and idiocy. It may be that sexual immorality and other forms of crime are increased by consumption. But these are questions whose discussion should be left to experts in medical and psychological science. One way, however, in which society is affected by consumption, is quite within the comprehension of the lay mind. It means an enormous loss in the aggregate productive power of the social body, and has no insignificant place among the causes of poverty.

The medical officer of health of an English town is authority for the statement that if phthisis had not existed as a cause of death every person born in England and Wales in 1901 would have had an average increase of two years and a half in his expectation of life, and that the working period, from fifteen years of age to sixty-five, would have been lengthened by nearly two years. The translating of human life into pecuniary value, a delicate undertaking, is the most striking way of expressing this economic loss. It has been estimated by Dr. Hermann M. Biggs that the total annual loss to

New York City from tubercular disease is at least \$23,000,000, and that the loss to the United States must be more than \$330,000,000.

There are no figures to indicate the amount of poverty that is due to consumption, but the experiences of charitable societies in every city furnish examples of families who become dependent from this cause. Sickness is found to be the cause of poverty in at least one case out of four. The long duration of consumption and its liability to fall on the chief wage-earner of the family tend to give it an importance as a cause of poverty out of all proportion to its importance as a cause of death. Those who, although self-supporting, have made no provision for the future, are easily pushed by the first attack of this disease over the border-line into the class of dependents, while the illness of the chief wage-earner soon eats up the little savings of the most provident family, and even when a subordinate member is the victim, his long illness becomes too serious a drain on the family's earning capacity.

In the absence of statistics on this point, illustrations of concrete cases may be taken from the records of the Charity Organization Society and the United Hebrew Charities of New York City. A native American, a mechanic of forty-one, with a wife and three small children, fell ill nine months ago. Neither the man nor his wife has ever been strong, but he is honest and industrious, and had always supported his family. They applied for help while the disease was incipient, were given relief for a few weeks until the man found work that was easy and suitable, and are again independent except for the milk and eggs supplied for the man. Another family has been brought from comfort to a reluctant dependence by this scourge of man. The head is an English silver-chaser, incapacitated for his trade on account of age. His wife is a delicate woman with poor eyesight. One son has tubercular abscesses. A daughter died of consumption not long ago. Another son, when just convalescent from an attack of typhoid fever, nursed this girl through her last illness, and he is now a victim of consumption. This young man, a skilled electrician, was the main support of the family, and his illness makes it necessary that they should receive charity. The daughter of a frail, deformed German widow was forced by consumption several months ago to give up her work, their only source of income. Another German widow, blind for four years, is entirely dependent on her twenty-eight-year-old son, who has recently

developed consumption. The mother of five children, all under thirteen, is caring for a consumptive husband and doing what she can to support the family by acting as janitress.

A picture too often paralleled in its squalid features is afforded by the case of a white woman married to a Chinese laundryman, both of whom have consumption. They are known to have lived in seven different houses in Chinatown, all undoubtedly infected, since 1894. The woman was found a few months ago, with her five small children, in one of the two dark damp rooms which are their home, covering cord by the light of a kerosene lamp to supplement her husband's scanty earnings. With their combined efforts they would be unable to maintain life on even this low plane without the assistance of friendly neighbors, the husband's "cousins," and the Chinese Mission.

Suggestive of much besides the points in hand and illustrative of many of the Hebrew characteristics, is this story of a Russian peddler who died a few months ago. He had just succeeded in bringing over his wife and two children when the hard work and privations of his two years in this country resulted in a physical breakdown leading into consumption. His brother and the brother's wife, with four children of their own, offered the hospitality of their two-room tenement to the whole family. There they all lived together, the two men, two women, and six children, through the months of the invalid's decline, asking help from no one, and brought to the notice of a charitable society, a week before his death, only by the report of a neighbor.

If nothing could be done it would be worse than idle to dwell on the ravages of this disease. But it is admitted now that consumption is both curable and preventable. As its prevalence is due largely to social conditions, and as it in turn aggravates social evils, so its prevention depends chiefly on social activity. Its complete eradication is only a matter of time if the public can be roused to a sense of its responsibility. Aside from humanitarian considerations, it is palpably of interest to the more fortunate part of society to save itself from the consequences of a neutral attitude.

Only recently have any systematic attempts been made. The stamping-out of tuberculosis depends on so simple a matter as the destruction of tubercular discharges, of which only the sputum of consumptives is a public danger. The effective campaign against

tuberculosis must include the multiplication of dispensaries, hospitals and sanatoria, to care for those in all stages of the disease who cannot otherwise receive proper treatment; the education of all classes of society in the few simple facts which they should know about the cause and nature of consumption; the control of the habit of indiscriminate expectoration; the disinfection of apartments where consumptives have lived. These are specific weapons for hunting down and exterminating the *bacillus tuberculosis*. But everything that can be done to make men healthier and happier is germane to this purpose of preventing tuberculosis. The improvement of the housing of the working classes; the multiplication of parks and playgrounds, gymnasiums and baths; the widening of streets; the enforcement of a standard of healthful conditions in all occupations; the reduction of the working day; the raising of wages; the education of the women and girls of the tenements in the art of housekeeping and the science of food-preparation; the crusade against the noxious features of the saloon; the substitution of scientific instruction about the effects of alcohol in place of the nonsense too often taught now in the public schools—all these and kindred efforts tend, less indirectly than might be thought, to reduce the death-rate from tuberculosis.

Progress has already been made. In New York City the specific measures against tuberculosis that have been in force for the last fifteen years, in concert with the general sanitary improvements, have accomplished a reduction of 40 per cent in the death-rate from tuberculosis. If the death-rate of 1886 were still in force the number of deaths from consumption in Manhattan and the Bronx would have been 8,500 last year instead of 5,000. In the United States consumption was the cause of one-eighth of the mortality in 1890, of only one-tenth in 1900.

But the decrease is significant not so much of what has been done as of what may be expected. As long as this preventable disease is responsible for one-third of the deaths of men and women between the ages of fifteen and forty-five the situation seems rather to urge to more vigorous effort than to allow pause for gratulation.

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